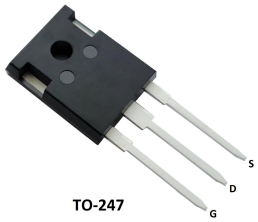
MS12N120HGC0

Planar Process NPN MOS

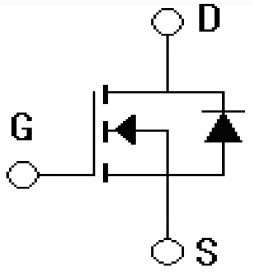
Features

- V_{DS}=1200V,I_D=12A
  $R_{DS(on)}$<1.5Ω @ V_{GS}=10V
- High density cell design for ultra low Rdson
- Low gate charge
- Improved dv/dt capability
- RoHS product



Applications

- High Voltage Switched-mode and resonant-mode power supplies
- High Voltage Pulse Power Applications
- High Voltage Discharge circuits in Lasers Pulsers, Spark Igniters, RF Generators
- High Voltage DC-DC converters
- High Voltage DC-AC inverters



Absolute Ratings (Tc=25℃)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	1200	V
Gate-Source Voltage	V_{GSS}	±30	V
Drain Current-continuous	I_D	12	A
Drain Current-pulse	I_{DM}	30	A
Single Pulsed Avalanche Energy	E_{AS}	500	mJ
Maximum Power Dissipation	PD TC=25℃ Derate above 25℃	290 2.17	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	I_D=1mA,V_{GS}=0V	1200	-	-	V

Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=V_{DSS},V_{GS}=0V	-	-	25	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±30V，V_{DS}=0V	-	-	±100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2.5	-	5.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	1.1	1.5	Ω
Forward Transconductance	g_{fs}	V_{DS}=20V,I_D=6A	5	9	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	-	3150	-	pF
Output capacitance	C_{oss}		-	300	-	pF
Reverse transfer capacitance	C_{rss}		-	25	-	pF

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DS}=600V,I_D=6A, V_{GS}=10V	-	34	-	ns
Turn-On rise time	t_r		-	25	-	ns
Turn-Off delay time	$t_{d(Off)}$		-	62	-	ns
Turn-Off rise time	t_f		-	34	-	ns
Total Gate Charge	Q_g	V_{DS}=600V,I_D=6A, V_{GS}=10V	-	85	-	nC
Gate-Source charge	Q_{gs}		-	14	-	nC
Gate-Drain charge	Q_{gd}		-	48	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Curret	V_{SD}	V_{GS}=0V,I_S=12A	0.5	-	1.2	V
Diode Forward Current	I_S	TC=25℃	-	-	12	A
Reverse recovery time	Trr	I_S=6A,dI/dT=100A/μS VR=100V,VGS=0V	-	-	300	nS
Reverse recovery charge	Qrr		-	0.5	-	μC

Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance,junction to Case	R_{th}(j-C)	0.4	℃/W

Notes:

1. Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%

Electrical Characteristics

Fig. 1. Output Characteristics @ 25ºC

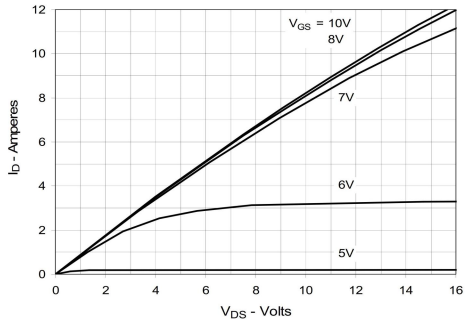


Fig. 2. Extended Output Characteristics @ 25ºC

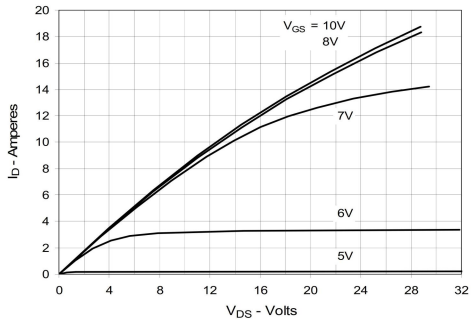


Fig. 3. Output Characteristics @ 125ºC

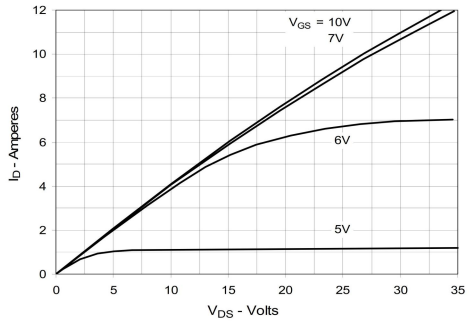


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 6A Value vs. Junction Temperature

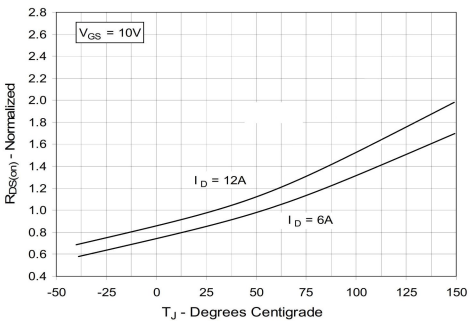


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 6A Value vs. Drain Current

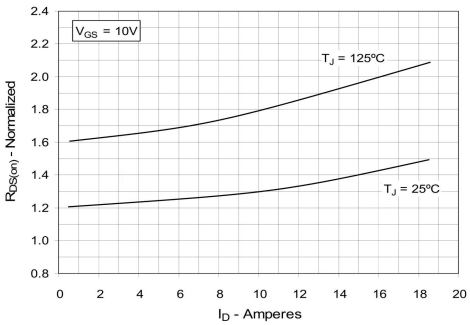


Fig. 6. Maximum Drain Current vs. Case Temperature

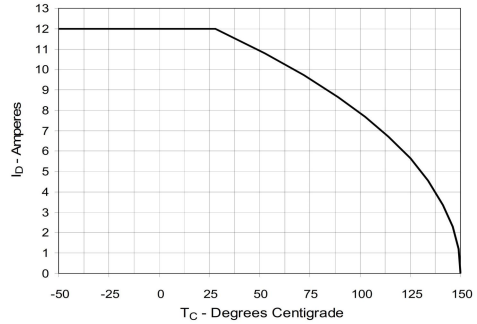


Fig. 7. Input Admittance

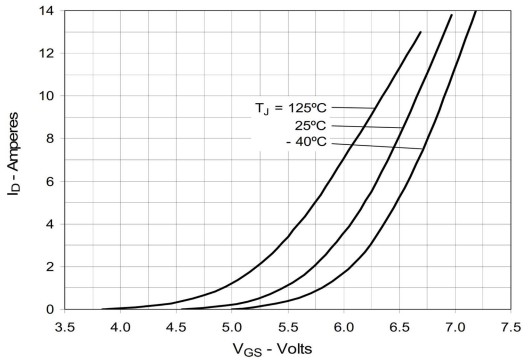


Fig. 8. Transconductance

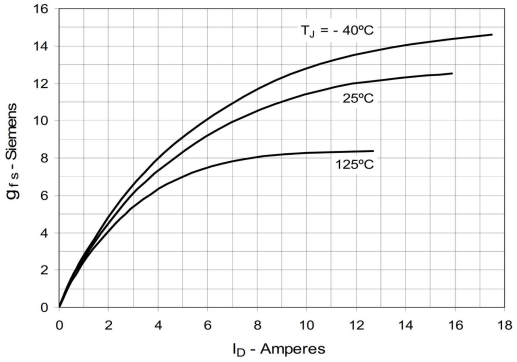


Fig. 9. Forward Voltage Drop of Intrinsic Diode

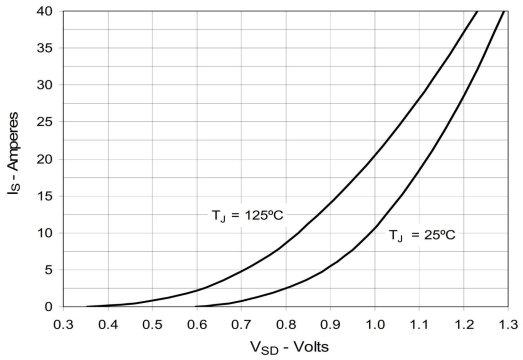


Fig. 10. Gate Charge

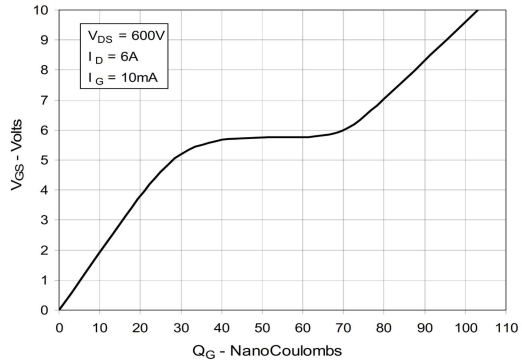


Fig. 11. Capacitance

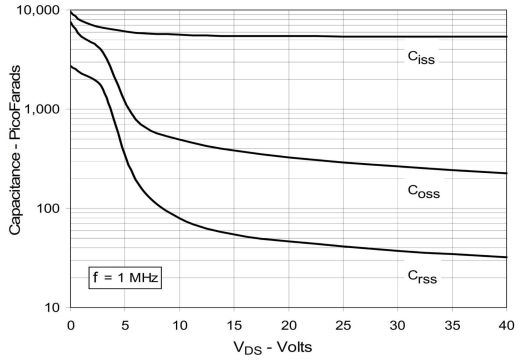
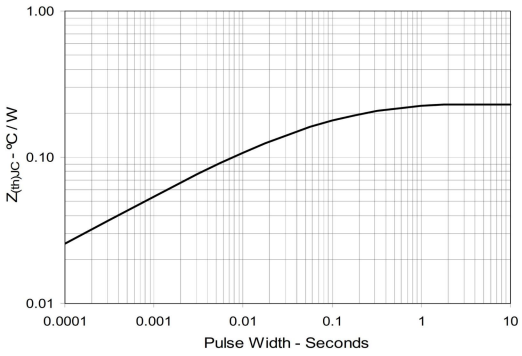


Fig. 12. Maximum Transient Thermal Impedance



Package Mechanical DATA